

You don't have to chain the folks in the Model Shop to their work — they love it already. Story on Page 3.



Magellan has discovered the longest known channel in the solar system with its radar sensors. Story on Page 4.

Space News Roundup

Vol. 30

September 6, 1991

No. 35

Comptroller now directorate-level office

Draper remains in charge, reports to center director

By Pam Alloway

JSC's Office of the Comptroller is now a separate directorate-level organization under a plan to improve NASA's financial management practices and strengthen the budget process.

The functions, responsibilities and organizational structure of the Office of the Comptroller, which previously was part of the

Administration Directorate, will not change in the immediate future.

Comptroller Wayne Draper will now report directly to JSC Director Aaron Cohen.

Draper said there are no plans to change the staffing of the organization. About 140 employees are divided into the Financial Management Division, the Central

Budget Office and six business management offices that provide financial management support to the major JSC directorates.

"The institutional and programmatic funding is the lifeblood of our center," Draper said.

"This organizational move is designed to make all of our financial functions more efficient and effective," he added. "I look forward

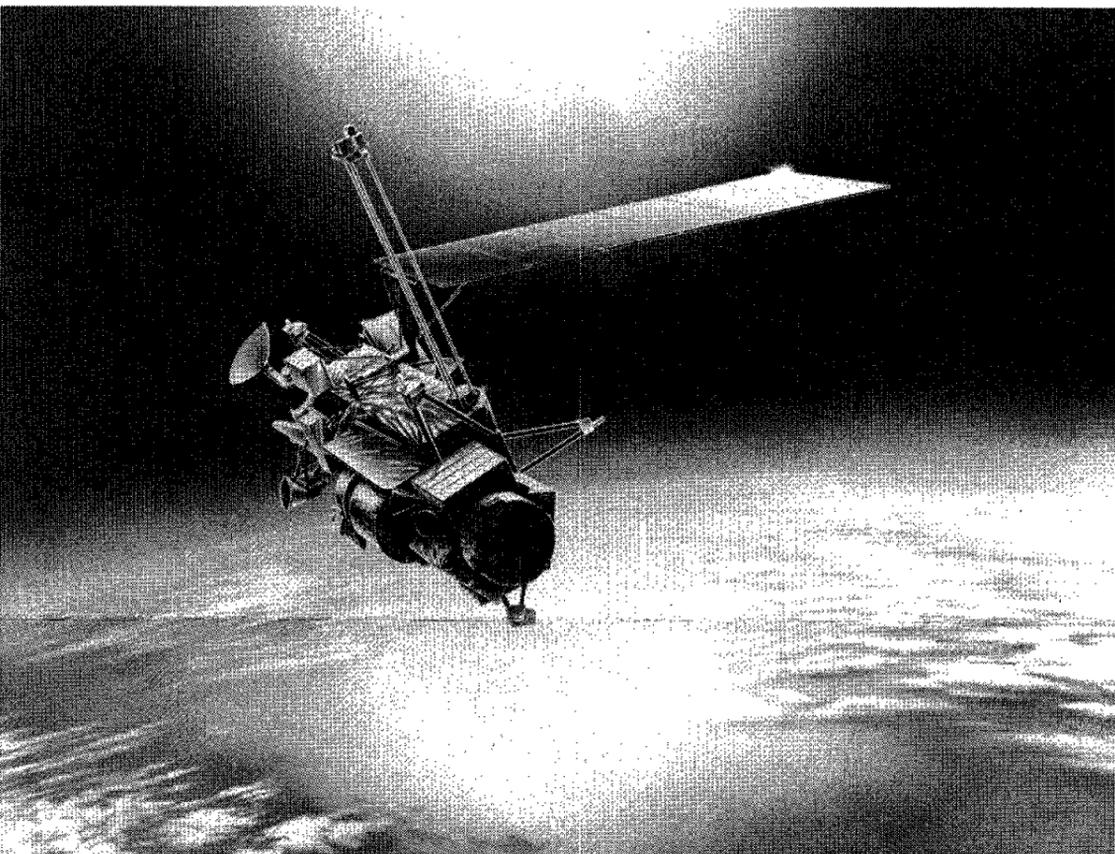
to continuing to work toward those objectives."

The reorganization was prompted by the Chief Financial Officers Act of 1990 that requires many federal agencies, including NASA, to improve their financial management practices and strengthen their budget process.

The Office of the Comptroller's new mail code will be "LA."



Wayne Draper



NASA Illustration

The Upper Atmosphere Research Satellite, with its distinctive single solar array, orbits the Earth in this artist's concept. The first element of NASA's Mission to Planet Earth will carry 10 scientific instruments to measure the chemistry, dynamics and energy input into the Earth's upper atmosphere.

Keynote Hispanic speaker eyes free trade

By Kelly Humphries

A pioneer in Hispanic employment issues and the Houston consul general of Mexico will address JSC employees celebrating National Hispanic Heritage Month on Tuesday.

The Hispanic heritage program will begin with a "merienda" of pastry and coffee at 8 a.m. Tuesday in the Gilruth Center ballroom, and continue with speakers at 9, 10 and 11:30 a.m. A leadership workshop will round out the day, beginning at 1:30 p.m.

Keynote speaker Ricardo

Ampudia, the consul general of Mexico in Houston, will discuss the recently signed free trade agreement between the United States and Mexico.

"That's a very hot issue," said JSC Hispanic Employment Program Manager Lupita Armendariz. "There are going to be many opportunities for the U.S. and Mexico, and for small business entrepreneurs in the states that border Mexico."

The day will begin with a historical overview of Hispanic employment in the federal government, presented by

Dr. Edward Valenzuela. Valenzuela was involved in the Senate hearings in the late 1960s and early 1970s that led to today's federal Hispanic employment programs.

At 10 a.m., Astronaut Franklin Chang-Diaz will present a slide show and discuss his two shuttle missions.

Following the luncheon, Valenzuela will present a community leadership development workshop patterned after the one he offers as a professor at the Hispanic Leadership Institute in Phoenix.

Please see **HISPANIC**, Page 4

Technicians wind countdown clock for Monday start

By James Hartsfield

Technicians are winding up the countdown clock for *Discovery* and STS-43, and it will begin ticking at 5 p.m. CDT Monday toward a 5:57 p.m. CDT Thursday launch.

Discovery's crew — Commander J.O. Creighton, Pilot Ken Rightler and Mission Specialists Mark Brown, Jim Buchli and Sam Gemar — are scheduled to arrive in Florida two and a half hours after the countdown starts Monday.

This week, *Discovery's* engine compartment was closed out for the flight. The main cargo, the Upper Atmosphere Research Satellite, also received finishing touches. Today, work centers on pressurizing *Discovery's* orbital propulsion system fuel tanks for the flight.

UARS, to be deployed on flight day three, is the first major element of NASA's Mission to Planet Earth. The 14,419-pound spacecraft will carry 10 scientific instruments into a 305-nautical-mile orbit to study winters in the Northern Hemisphere and the Antarctic ozone hole. UARS will conduct atmospheric and ozone studies for 20 months, measuring the chemistry, dynamics and energy input into the Earth's upper atmosphere.

People who live beneath *Discovery's* ground track from Canada to Florida may have a chance to see the shuttle's meteoric reentry at the end of the 5 day, 7 hour flight. *Discovery* is scheduled to land at KSC's Shuttle Landing Facility shortly before 1 a.m. Sept. 18. The ionization that occurs around the

shuttle as it passes through the atmosphere should be visible as *Discovery* passes over North Dakota, Minnesota, Wisconsin, Iowa, Illinois, Indiana, Kentucky, Tennessee, Alabama and Georgia on its way back to Florida. The pre-launch ground track estimate could change as the mission unfolds.

Elsewhere at Kennedy Space Center, *Atlantis*, in Bay 2 of the processing hangar, is being readied for a November launch on shuttle mission STS-44 to put the Department of Defense's Defense Support

Program satellite in orbit. *Atlantis's* main propulsion system was checked out this week, and tests were performed on the electrical generating and distributing system. The shuttle's three main engines are slated for installation next week.

Endeavour is in Bay 1 of KSC's processing hangar, and work this week on the latest shuttle involved installation of the flight control computers and a test of the cooling system's radiators. *Endeavour* is being prepared for a launch next April to rescue the stranded Intelsat V satellite.

Also at KSC this week, a third shuttle processing hangar, designated Orbiter Processing Facility 3, was dedicated. Formerly called the Orbiter Maintenance and Refurbishment Facility, modifications to the hangar were made using equipment shipped to Florida last year from Vandenberg Air Force Base in California.

Please see **COLUMBIA**, Page 4



DISCOVERY

Gregory orbits Dome on fleet feet

By Pam Alloway

Astronaut Bill Gregory collected a lot of T-shirts from running foot races before he began collecting trophies. But these days he carts home T-shirts and trophies galore.

Most recently Gregory won first place in the seventh annual Houston Chronicle Dome Run on Labor Day. And he did it with a "kick" that pushed him ahead of his closest competitor with whom he had traded the lead for much of the 10-kilometer (6.2-mile) race.

As Gregory and his close competitor neared the floor of the Astrodome signaling the end of the race, Gregory sprinted forward, lengthening his stride and pushing him just two seconds ahead of his competitor.

But the dome run held a special place in Gregory's running history even before his recent win.

"We arrived in Houston just a little over a year ago," Gregory said. "The 1990 dome run was the first

run I competed in since arriving in Houston. I took sixth place there in 1990 and since this was my first anniversary I was hoping to do well."

Gregory's pace during the 1991 dome run was about five minutes and 20 seconds per mile. He belongs to both the Bay Area Running Club and the Terlingua Track Club.

Running has been a part of Gregory's life for many years. He began running as a member of his high school cross country team in the fall of 1974 in his birthplace of Lockport, New York.

Gregory, a major in the United States Air Force, also ran his first two years at the U.S. Air Force Academy. He took a break from competitive running after that but restarted in the fall of 1979 while in graduate school at Columbia University in New York City.

"I've been running since then every day," he said. "I run about 10 miles every day."

Please see **GREGORY**, Page 4



Astronauts Bill Gregory, left, Nancy Sherlock and Daniel Bursch show off their first-place trophy from August's Houston Triathlon. The team called itself "Hairballs" in honor of the astronaut class of '90's nickname.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays.

General Cinema (valid for one year): \$4.
 AMC Theater (valid until May 1992): \$3.75.
 Loews Theater (valid for one year): \$4.
 Astroworld (valid 1991 season): season, \$44.94; child less than 4-feet, \$10.12; one day, \$15.85; Waterworld, \$8.15.
 Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adult, \$17.25; (2-day) child \$15.95; adult, \$21.95.
 Six Flags (valid until Nov. 17): adult (1 day) \$15.95, (2-day) \$20.95; child under 4 feet, \$14.95.
 Country and western dance (7 p.m. Sept. 14, Gilruth) \$15 per person.
 Astros vs. Cincinnati Reds (7 p.m. Sept. 21, Astrodome): \$9.
 Deep sea fishing (7 a.m.-7 p.m., Sept. 21, includes bait, tackle): \$45 to fish, \$20 to ride.
 Lovin' Feelings concert (7:30 p.m. Sept. 28, Summit): \$22.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

Defensive driving — Course is offered from 8 a.m.-5 p.m., Oct. 12 or Nov. 16. Cost is \$15.

Aerobic dance — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$24.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Monday and Wednesday nights. Cost is \$24.

Weight safety — Required course for employees wishing to use the Gilruth weight room. The next classes will be from 8-9:30 p.m. Sept. 18, Oct. 3 and Oct. 17. Cost is \$5; preregistration required.

Country and western dancing — Intermediate class meets from 8:30-10 p.m. Mondays beginning Sept. 9. Cost of six-week course is \$20 per couple.

Ballroom dancing — Professional instruction in beginning, intermediate and advanced dance. Eight-week session meets Thursdays beginning Oct. 3. Cost is \$60 per couple.

Volleyball clinic — Eight-week clinic teaches basic volleyball skills from 2-4 p.m. Saturdays starting Sept. 7. Cost is \$25 per person.

Tennis — Beginning tennis class meets 5:15-6:45 p.m. Mondays beginning Sept. 9; advanced beginner class meets 5:15-6:45 p.m. Wednesdays beginning Sept. 11. Cost is \$32 per person.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed education program. Call Larry Wier, x30301.

JSC

Property

Sale: Wooded lot near NASA, owner finance avail, \$18.5K, 644-2616.

Sale: Meadowbend, 3-2-2, split floor plan, both formals, separate study, huge master bath w/whirlpool, oversized lot, assum w/no approv. x30382 or 334-1103.

Sale/Lease: LC, 2 BR, FPL, deck, \$650/mo. Mike, x38682 or 332-7205.

Sale: Brenham/Chappel Hill, 55 plus acres, FM frontage, water, elec, metal shed, fenced, pecan trees, hay, \$125K, 283-0484 or 334-5007.

Lease: CLC 3-2-5-2cp, 2 story townhouse, W/D hookups, avail 10/1, \$650/mo. 283-5718 or 283-1950.

Sale: Wimberley, TX, Three hill country homes on Blanco River, Sharon, 333-5848.

Lease: Nassau Bay, fresh lake waterfront, 4-2-5-2, pool, FPL, 3K sq ft, avail 10/1, \$2K/mo. Phil, x37892 or 333-9518.

Sale/Lease: Waterfront complex, townhouse, 3-2-2 car spaces and storage locker, util rm, 2 FPL, boat slip, formal DR, den, wet bar, assum 8.7%, \$89.9K/\$1.4K/mo all bill. 280-5801 or 326-2221.

Two lots at Hill Top Lakes, \$2.5K/ea or \$4K/both. Lee, 480-8001.

Rent: Room in new 2 story, 4BR house, fenced yard, \$400 plus some util. 474-4742

Cars & Trucks

'89 Plymouth Reliant, bucket seat, tilt, cruise, sport pack, A/C, AM/FM, auto, ex cond, low mi, \$5250, 664-2616.

'80 Pontiac Phoenix, V6, A/C, 4 dr liftback, auto trans, stereo, AM/FM, good cond. \$1950; '84 Nissan 300ZX 2 plus 2, auto, A/C, gray, good stereo, \$5650; or trade either for Apple Mac SE/30 or Mac II pc. x30092 or 481-3637.

'77 Ford E150 Window Van, 351w engine, auto, A/C, well maintained, d51.7K. Bauch, x31309 or 333-3382.

'72 MG, kept in garage, ex cond, \$4.5K. 523-2188.

'90 Mazda Miata, red, soft top, 4K mi, P/W, cruise, speakers in headrest, \$15K, 479-5139.

'89 Honda Prelude SI, sky blue, 28K mi, 5 spd, alum wheels, alarm, loaded, ex cond, \$12.5K. 480-9125.

P/U camper for Toyota lg bed, w/boat rack, \$200. 486-9391.

'87 Samuri Suzuki JX, convertible, A/C, AM/FM/cass, gray, ex cond, \$4.2K. x36255 or 326-1414.

'30 Model A Ford coupe, restored to good cond, w/rumble seat. Milton, 471-0213.

'81 Diesel Rabbit, 5 spd, A/C, 150K mi, runs, needs some work, \$700. 992-5740.

'87 Toyota Celica GT liftback, loaded, ex cond, \$6K. Gonzo, x37824 or 644-2806.

'87 Nissan Maxima GXE, 2 tone gray, loaded, sunroof, tinted, tire ins, ex cond, \$8K OBO. 333-7248 or 480-9544.

Fleeting 17.5 ft, travel trlr, fully self contained, A/C, elec lift, ex cond, gas stove/oven, elec refrig. 339-1152.

'90 Pontiac Sunbird SE, red, A/C, AM/FM/cass, less than 10K mi, ex cond, \$9K. 332-0558.

'78 Datsun King Cab PU parts, 335-2270 or 481-9684.

'85 Chevy Cavalier, 4 dr, 4 cyl/2.0L, 70K mi, ex cond, \$2.9K OBO; R/C "Hornet" car, assembled, 30 mph, 7.2 v bar, AC/DC recharger, transmitter, ex cond, spare parts, assembly manual. \$195 OBO. 488-5522.

'87 Volvo, 760 Turbo/loaded, leather seats, P/W, P/L, P/S, sunroof, A/C, stereo cass, metallic gold w/blk int, \$16K OBO. Steve or Mary, 480-7127.

'88 Ford Escort GT, 2 dr, hatchback, blk w/blk int, tinted, 5 spd, A/C, AM/FM/cass, new tires, 40K mi, \$5.2K. 482-8820.

'84 Buick Electra LTD, V8, all power, 79K mi, ex cond, \$3.6K. Ruth, 265-1311.

'86 Chevy Beretta GT, 45K mi, warr. V6, loaded, \$6.5K. Steve, 333-7371 or 333-4565.

'89 Honda Civic LX, 4 dr, auto, P/W, P/D, P/B, P/S, AM/FM/cass, A/C, new tires, ex cond, \$7.6K. Jay, x35814 or 992-3149.

'89 Nissan Pulsar NX 12 Valve, T-Tops, 31K mi, Kenwood system, \$6.9K OBO. 474-4742.

'87 Chevy Celebrity, 2 dr, A/C, tilt, cruise, 100K mi, \$3.1K. x31676 or 533-1599.

'85 Chrysler New Yorker, gun metal blue, 4 dr, 2.2L turbo, loaded, 72.5K mi, \$3995. 946-7587.

'77 Chevrolet Vega, \$250 OBO. Dick, x37121.

'85 Chrysler Laser, auto, low mi, loaded, ex cond, \$3.5K. 488-4915.

'85 Nissan 300ZX, auto, low mi, digital display, good cond, \$6.3K. x38265 or 482-1633.

'89 GMC Suburban, loaded, ex cond, dual air. 852-8622.

Cycles

KHS Mountain bike, model: Montana Crest, frame sz 18", tire sz 24"x1.9 Knobbys, 21 spd w/Shimano Exage Trail front triple crank set, derailleurs, and shifters, purple, \$150. 583-1794.

Yamaha FZ750, water cooled, 20 valve, blue/whitex cond, Arai super vent, \$3.6K. Gary, x32144.

'78 Honda CB750K, new batt, new brakes, reconditioned carburetors, new Michelin tire, all documented work, \$750. 488-2960.

'91 Suzuki Bandit, ex cond, red, 2 yr ext warr, \$3.4K. 480-6713.

Boats & Planes

'83 Lowe Jon boat, 16 ft, 35hp Evinrude/electric starter, Hummingbird 41D trolling motor, carpet, 4 cushioned seats, galv tilt trlr, \$3K. 331-0608.

'84 27 ft Gulf pilothouse sailboat, inside/outside steering stations, diesel, galley, head, depth/knot meters, good cond, \$24K OBO; Bic sailboat Rock-N-Roll, \$475 OBO. Diana, x33443 or 538-1040.

'86 16 ft Crestliner Classic, 80hp Evinrude, good cond, \$1.8K. 333-7776.

Want Yamaha "Wave Runner" dead or alive. Don, x38039 or 333-1751.

LIDO 14 sailboat, sails, trlr, \$995. R Hoover, x31360 or 996-7716.

'79 20 ft cntr console mako w/200hp Johnson, '86 galv trlr, fish finder, VHF radio, ex cond, \$9.5K OBO. 996-9705.

Canoe, 17 ft. Grumman Whitewater, \$300. Ross, x38414.

'72 18 ft Baymaster sailboat w/trlr, 4hp Evinrude motor, 11K OBO. 326-2123.

Audiovisual & Computers

Sharp VHS camera, case, light, batt for recorder and light, recharger, \$600. 333-6821 or 332-9932.

Quasar full sz VHS Camcorder, ex cond, used less than 30 hrs, ex cond, was \$1.5K, now \$850. Nancy, x34006.

Digison port computer/PCXT compatible CPU 8088-2.8MHz, two 3.5 in DD, 64K RAM, WT 4.6Kg, RS-232C port, 5.25 in floppy disk port, 62 pin slot for external slot box, parallel printer port, \$400. Valerie, 283-5312.

IBM software, educational, Word-Scramble, Play & Learn, age 7-11, Word Customizing w/manual, \$25; Text books for UH Central ELEE 6370/5440-Adv Digital Design, ex cond. Young, 283-4813.

Apple 2e computer, 1FD, 80 Col, SW, \$300. Steve, 333-7371 or 333-4565.

Amiga 100A w/full MAC Plus emulation, 1.5 Meg RAM, external Amiga and Mac drives, MAC O RMS, SW, \$1025. 280-1579 or 482-5536.

Loyds record player, two speakers, AM/FM radio, \$25. 946-7587.

IBM XT compatible w/640K, CGA color moni, dual 5.25 FD, 30 Meg HD, 2400 baud Hayes compatible modem and SW, \$650. Cheryl, x33958 or 437-1265.

MAC PLUS, 20MB HD, 4M RAM, Imagewriter II printer, plus ext drive, SW, ex cond, complete sys, \$1.1K. 280-8796.

Musical Instruments

Armstrong flute, \$200. 332-4780.

Buescher alto Sax/Bundy alto Sax, \$350/ea; Hamilton clarinet, wood, \$140, all good cond. Karl, 944-8717.

Yamaha FG 160 Steel Guitar, ex cond, \$200. Vern, x32261.

Clarinet, \$200. Lydia, x37031.

JSC

Dates & Data

Today

Cafeteria menu — Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped potatoes, peas, cauliflower.

Monday

Cafeteria menu — Special: breaded outlet. Entrees: beef chop suey, Polish sausage with potato salad. Soup: French onion. Vegetables: okra and tomatoes, green peas.

Tuesday

Hispanic Heritage Program — The JSC Astronomical Society will meet at 7:30 p.m. Sept. 13 at the Lunar & Planetary Institute, 3303 NASA Road 1. Paul Peterson will discuss and demonstrate telescope mirror testing. Call Eleta Malewitz, 486-2197, for more information.

Cafeteria menu — Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables: green beans, buttered broccoli, whipped potatoes.

Sept. 13
Astronomical Society meets — The JSC Astronomical Society will meet at 7:30 p.m. Sept. 13 at the Lunar & Planetary Institute, 3303 NASA Road 1. Paul Peterson will discuss and demonstrate telescope mirror testing. Call Eleta Malewitz, 486-2197, for more information.

Cafeteria menu — Special: fried chicken. Entrees: Salisbury steak, shrimp Creole. Soup: split pea. Vegetables: mixed vegetables, beets, whipped potatoes.

Sept. 19
IEEE videoconference — The Institute for Electrical and Electronics Engineers Galveston Bay Section will present a videoconference on "Quality Management Approaches to the Malcolm Baldrige Award" from 11 a.m.-2 p.m. Sept. 19 at the Gilruth Center. Registration deadline is Sept. 12; cost ranges from \$15 for student members to \$80 for nonmembers. For reservations, call Andy Lindberg, x31474. For more information, call Dr. Zafar Tazvi, 333-6544.

NMA meets — The Texas Gulf Coast Council of the National Management Association will conduct a

joint chapter meeting at 6:30 p.m. Sept. 19 at the Holiday Inn-Hobby. Dr. Donna Lopiano, director of intercollegiate athletics for women at the University of Texas will speak about "The Future of Management." Deadline for registration is Sept. 6; cost is \$25. Call Sandra Watts, 280-2488, or Susan Missiha, 280-2428, for more information.

Thursday

Cafeteria menu — Special: barbecue smoked link. Entrees: beef Stroganoff, turkey and dressing. Soup: chicken noodle. Vegetables: Lima beans, buttered squash, Spanish rice.

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Sept. 20

NMA seminar — The Texas Gulf Coast Council of the National Management Association will host "Management for the '90s and Beyond," a professional development seminar, from 8 a.m.-4 p.m. Sept. 20 at the Holiday Inn-Hobby. Deadline for registration is Sept. 6; cost is \$100 for members, \$125 for nonmembers. Call Sandra Watts, 280-2488, or Susan Missiha, 280-2428, for more information.

Sept. 24

BAPCO meets — The Bay Area PC Organization will meet at 7:30 p.m. Sept. 24 at the League City Bank and Trust, 303 E. Main, League City. Contact Earl Rubenstein, x34807, or Tom Kelly, 996-5019, for information.

Sept. 26

The Bay Area NAFE (National Association of Female Executives) Network will meet at 6 p.m. Sept. 26 at the South Shore Harbour Country Club in League City. Melanie Rhodeback will discuss pay equity and the undervaluing of women's jobs. For more information, call Sharon Westerman, 486-8927.

Swap Shop

Property

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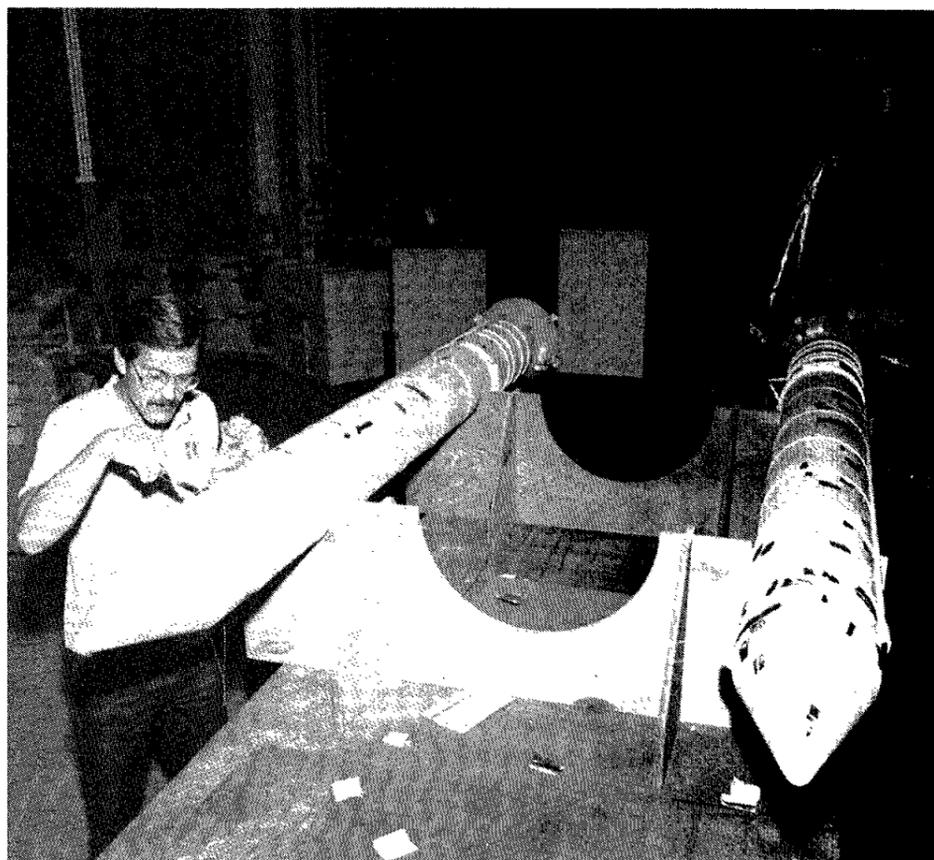
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'87 Chevy Celebrity, 2 dr, A/C, tilt, cruise, 100K mi, \$3.1K. x31676 or 533-1599.

'85 Chrysler New Yorker, gun metal blue, 4 dr, 2.2L turbo, loaded, 72.5K mi, \$3995. 946-7587.



These guys have already built space station

'You have to have a lot of patience — and you have to want to do it'

By James Hartsfield

They've built space shuttles here for years, more orbiters than they can count. And they've already built a space station. Now they are poring over blueprints and constructing the equipment for a second *Freedom*, a new configuration. When man goes to Mars, that journey likely will begin here — in miniature.

The things they assemble are often small, but the end results of their work have been and will be among mankind's biggest achievements. In the Models and Plastics Section at JSC, work can be tedious, grueling and challenging. But most of those who do it thrive on it.

"I've been building models since I was 12 years old," says Mike McGuire, one of the lead model builders in the group. "If someone would've told me 13 years ago that I'd be building models for NASA, I wouldn't have believed it. It's just something that evolved. You have to be meticulous. You have to have a lot of patience — and you have to want to do it."

"Can you imagine your hobby being your life? It's unbelievable," adds Tom Hall, who's been building models on his own since age 5 and for NASA for more than five years. "There is always something different to do here and you're never bored. I just love making something look pretty. It doesn't matter whether it's something small or a building."

A model is born here in the same manner as is the real thing. Blueprints are the first step, often the blueprints of the full-scale subject. The blueprints are miniaturized, putting everything to exact scale. From there, the modeler must chart his own path.

Figuring out how to construct detailed models of spacecraft is an art, and the way the Model Shop, as the section is often called, works, one artist — whoever is assigned among the 10 workers in the shop — usually leads the building of a model from start to finish. There are no assembly lines.

Two basic categories of models are built here — models intended for display, such as those in the JSC Visitor Center, and models intended for research, such as wind tunnel models. Research models are more demanding in many ways, says McGuire, and with them, the future

hangs in the balance.

"Sometimes they have to be within three-thousandths of an inch. They're not for looks, but they have to be exactly to scale. Before you have a model, everything's in the cartoon stage. With a model, you have to see what it can really do," he says. "If they're off, then the research is off."

The models that are for looks, display models, are almost as exacting in a different way. The detail that can be added to them is almost infinite.

"I spent eight months working on a one-fiftieth scale model of Space Station *Freedom*," McGuire explains. "It's like an artist painting a picture. It's never finished. You've just got to put it down and say enough."

Some parts for models can be purchased commercially, but many must be fabricated. The Model Shop molds out of plastic, uses fiberglass, carves wood, cuts aluminum to precise shapes, uses photographic etching of metals and sands and blends and glues to get the desired effect. "I built models since I was

12, but I started fabricating models from nothing in 1978 — that's when I started actually making a living at it," says McGuire.

One project under way in the Model Shop is a one-fifteenths scale model of the space shuttle, destined to replace the current model in the Visitor Center. The new model is much more detailed, including items like full-scale representations of the oxygen vent cap at the top of the external tank. "You don't want to get carried away, but at the same time, you want to make a nice-looking model," McGuire says.

The main portions of the solid rockets and

external tank were made from aluminum cylinders. The tops and bottoms of the models were then molded from fiberglass. The plumbing fixtures for the external tank were precisely cut from solid aluminum with a water knife. The miniature shuttle components now are hanging from supports as they are sanded smooth in Bldg. 9S, as if they are in processing for a miniature flight.

The Model Shop has a display case of impressive credentials. In it are wind tunnel

models of early shuttles and early engineering models of the Apollo spacecraft, among others. Too large for it and permanently in place in Bldg. 9A is the full-scale shuttle replica called the Full Fuselage Trainer.

The Model Shop has built working replicas as well. Along with designer John Kiker, the shop built a flying scale model of the Boeing 747 Shuttle Carrier Aircraft and a piggyback orbiter to check the concept in the early days of the Shuttle Program. Kiker flew the radio-controlled

model at Ellington Field, and, as is obvious to those who saw *Columbia* fly over JSC recently, it worked.

More recently, the shop built a host of models of payloads that flew aboard Spacelab Life Sciences-I in June. And a model was built of the Crew and Equipment Translation Aid, a space-walking evaluation performed aboard STS-37 in April.

"Not everything that flies is modeled here, but a lot of it is," McGuire says.

"It's a lot cheaper to make a model to see if something will work, to see if it's feasible to go

ahead and build the real thing," explains Hall. "We make working models, and if they work right, then they build the real one and it flies."

Though eight months of tedium to build a model could send many people to the funny farm, McGuire and his coworkers are a different breed.

"If it's the right kind of weather ... if it's raining and cool so that I can get into the garage, I still will build models at home for fun," McGuire remarks.

The latest addition to the Model Shop promises to do away with some of the tedium involved in their work. Only the third machine of its kind built, the Stereo Lithography Apparatus uses a laser to solidify an ultraviolet light-sensitive plastic resin, creating a model as a platform recedes into the resin vat. The machine is driven by Computer-Aided Design software. The computer design guides the laser as it solidifies tiny layer after tiny layer of resin to create the model. An engineer can bring his design over, slip a disk into the computer and create a plastic model of it up to as large as a 23-inch by 20-inch cube.

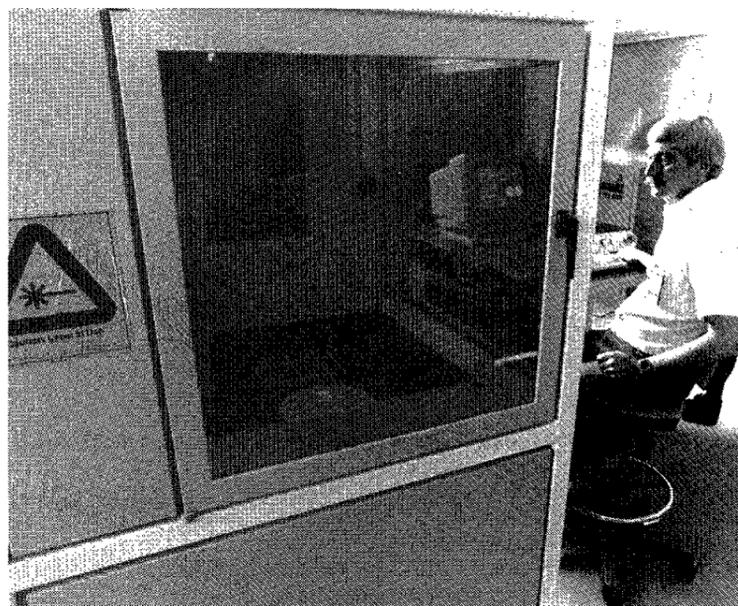
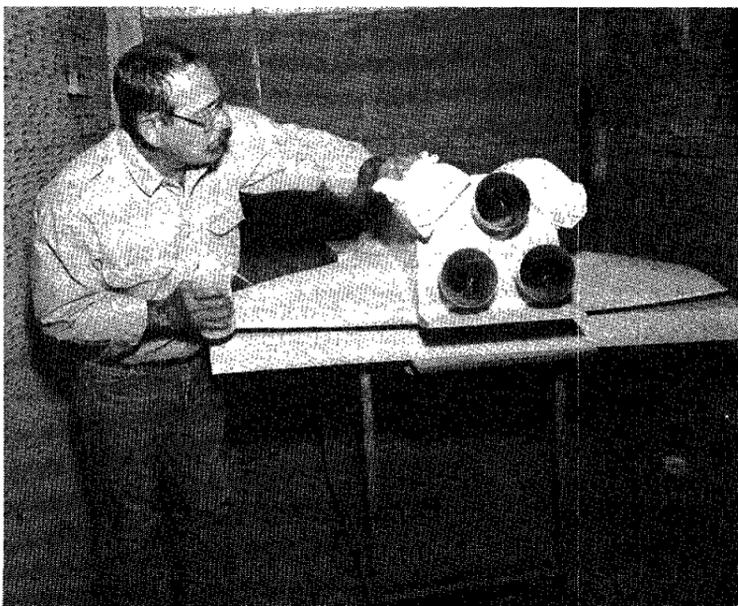
"It is the latest technology and can save thousands of hours from milling or carving a similar part," McGuire says.

"We're getting a lot of response to it," adds Jack Anthamatten, one of the laser-modeler's operators. "We're just now passing out of our training phase with it and doing some real jobs."

Just what is it that endears a man to bringing reality down to size?

"It's just the going through all of the things you have to go through to get there. I like the finished product. You've just got to dream it up. There's one person going around figuring all of this stuff out, but everybody gets involved," McGuire says. "I can think back on just about every one we've done since I've been here. The part I like the best? I guess it's watching them go out the door."

"You have something to show for your work when you finish," adds modeler Ernie Murry, who has worked extensively on the new Visitor Center shuttle model. "This (shuttle model) will be here for thousands of people to see. It may not have my name on it, but I'll know who built it."



Top left: NASA modeler Tom Hall works with a figurine destined for a lunar habitat model. Top right: Ernie Murry put details on a one-fifteenths scale pair of solid rocket boosters that will be part of a new shuttle model displayed in the JSC Visitor Center. Center: Herb Mitchell, chief of the Models and Plastics Section, shows off some of the Model Shop's history, including Apollo engineering models and wind tunnel models of early shuttle concepts. Bottom, far left: Mike McGuire cleans an orbiter model prior to spray painting in the Bldg. 9S paint booth. Bottom, left: Stereo Lithography Apparatus operator Jack Anthamatten works with the laser-guided machine.

JSC duo wins Wright Award

Extravehicular Mobility Unit Project Engineer Susan Schentrup and Life Support Project Engineer Mariann Brown recently were notified they have won the 1990 Wright Brothers Award.

The award was presented by the Society of Automotive Engineering for a paper they co-authored entitled "Requirements for Extravehicular Activities on the Lunar and Martian Surfaces (SAE901427)."

Established in 1927, the award recognizes the authors of the best paper relating to the invention, development, design, construction or operation of an aircraft and/or spacecraft.

The engraved bronze medal and certificate will be presented at AEROTECH '91 during a Sept. 25 banquet in Long Beach, Calif.

Brown top secretary

Wanda L. Brown, secretary in the Network/

Communications Branch of the Information Systems Directorate, recently earned the Marilyn J. Bocking Award for Secretarial Excellence.

Brown, who maintains management calendars, prepares and tracks correspondence, schedules meetings and conferences and tracks branch action items, was honored for providing "fast, error-free work in a competent, dependable and unassuming manner."

She was cited specifically for her role in helping assimilate new employees into the branch following a centerwide reorganization that moved a section from Engineering into the ISD Branch, and for her ability to quickly learn and use computer business software packages.

Simulation, weather teams hang MCC plaque

John F. Poffinbarger, lead simulation



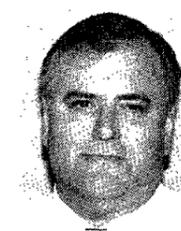
Schentrup



M. Brown



Poffinbarger



Morrill



W. Brown

supervisor for STS-43, earned the honor of hanging the mission plaque at the conclusion of the August flight.

Poffinbarger, representing Mission Operations's Training Division, was assisted by Charles C. Morrill of the Space Flight Meteorology Group, which provides weather forecasts for all shuttle landing sites.

"Even though they are kind of 'transparent,' the work they do is critical to us flying safely," said STS-43 Lead Flight Director Rob Kelso.

Kelso said the training team was recognized in the Mission Control Center ceremony because STS-43 tested the readiness of

the crew and three control centers, with the added duty of coordinating the work of three sim teams.

"They not only test our knowledge in our mission preparation, but they also provide us the level of confidence to fly successfully and safely," Kelso said.

The weather forecasters were cited for their support of the first planned Kennedy Space Center landing in six years, which included a three-year comparison of forecasted vs. actual weather conditions that led to a significant increase in forecast reliability, Kelso said.

Two associate administrator posts created

NASA Administrator Richard Truly has appointed two new associate administrators, one for exploration and one for human resources and education.

Dr. Michael D. Griffin will fill the newly established position of associate administrator for the Office of Exploration. He will provide direction, integration and oversight of activities involving NASA exploration goals, including program, technical and fiscal management.

Retired Air Force Lt. Gen. Spence "Sam" M. Armstrong is assigned to the newly established position of associate administrator for the Office of Human Resources and Education. He will be responsible for developing NASA's human resources strategic plan and for furthering NASA's emphasis on national education goals.

He also has worked at NASA's Jet Propulsion Laboratory, participating in advanced studies on the Mars Sample Return and Mars Rover programs Goddard Space Flight Center.

Armstrong retired from the Air Force in April after nearly 34 years of service. His last assignment with the Air Force was vice commander of the U.S. Air Force Systems Command. Prior to that, he held such notable positions as vice commander-in-chief of the Air Force's Military Airlift Command, chief of the U.S. Military Training Mission to Saudi Arabia, and commander of the Air Force Military Training Center at Randolph Air Force Base, Texas. Following retirement, he served as director of program architecture for the Synthesis Group.

Hispanic luncheon tickets still on sale

(Continued from Page 1)

All JSC and contractor employees are invited to attend as their workloads permit.

Today is the last day to make reservations with a member of the JSC Hispanic Advisory Committee. Call Michael Ruiz, x38169, Estella Gillette, x33077, Frank Moreno, x31208, or Denise Navarro, 488-8806 to purchase \$8 luncheon program tickets.

Gregory wants to be fastest on two feet

(Continued from Page 1)

He said he didn't have a specific goal other than one sure to get a chuckle from his colleagues.

"You know you've got your basic oldest astronaut, and tallest astronaut and youngest astronaut," Gregory said. "I'd like to be the fastest astronaut on two legs."

Among the other recent races Gregory has participated and placed in are: the June 25 Oxy-Chem 9th Annual Corporate Invitational Relay in which Gregory and NASA employees Debbie Langan, Lisa Spence and Pat Chimes



GLOBAL VISION — The crew of STS-45 is already training for its May 1992 mission, including stints on the KC-135 zero-gravity simulating aircraft. Shown with an inflatable globe are, clockwise from bottom left, Commander Charlie Bolden, Payload Specialist Byron Lichtenburg, Mission Specialist Kathy Sullivan and Mike Foale, backup Payload Specialist Dirk Frimout, Pilot Brian Duffy and Payload Specialist Michael Lampton.

JSC Photo by Jack Jacob

Gemini team plans silver rendezvous

A ground-based rendezvous of the Gemini Program Office team is scheduled for Oct. 28 to celebrate the 25th anniversary of the Gemini program.

The reunion will be held during the Space Exploration '91 Conference at the South Shore Harbour Conference Center and rendezvous organizers are scouting out team members, said Charles W. Mathews, manager of the Gemini program.

People who served in the Gemini Program Office and have not received a personal invi-

tation to the rendezvous by Sept. 15 and are interested in attending the event should mail or call in their address update to Emily Ertl, 11435 Sabo Road, Houston, 77089 or phone 713-481-5709, or contact Joan Taylor at 713-280-2707.

The Gemini flights began with Gemini 3 in March 1965 and ended with the flight of Gemini 12 in November 1966. Gemini 4, in June 1965, was the first to be controlled from the Manned Spacecraft Center, now JSC, in Houston.

Columbia undergoes structural inspections

(Continued from Page 1)

The hangar is now a full-fledged processing facility and will be used for preparations of *Discovery* for its next flight after STS-48. OPF 3 is across the street from its sister processing facilities.

At Rockwell's Palmdale, Calif., facility, structural inspections of the original shuttle, *Columbia* have gone well during the past several weeks.

The Orbital Maneuvering System pods and forward Reaction Control System on the spacecraft for its ferry flight from Florida have been removed. Inspections are either under way or completed on all of the shuttle's

attachment points, the connection area for the 17-inch fuel line, and the leading edges of the wings.

Also, electrical wiring is now being installed in the middle fuselage as the first part of modifications that may allow *Columbia* to stay in orbit as long as 16 days. Late this week, technicians planned to fine tune gauges in the wings that record the stress on them during flight.

All activities at Palmdale are on schedule and the inspections have found no major problems.

Columbia is scheduled to return to Florida on Jan. 24, 1992.

Magellan marks longest channel in solar system

The Magellan spacecraft, mapping the surface of Venus with imaging radar, has discovered the longest channel known in the solar system, said Project Scientist Steve Saunders.

The channel crosses the plains of Venus for 4,200 miles, longer than the Nile River, the longest river on Earth, Saunders said.

"The very existence of such a long channel is a great puzzle," Saunders said. "If the long channel were carved by something flowing on the surface, the liquid must have had unusual properties."

Saunders said it may have been some material that was near its freezing or melting point at the average surface conditions of Venus — surface pressure 90 times that of Earth at 864 degrees Fahrenheit.

"There are no very likely candidates for a liquid," he said. "Lava, even very high temperature types, would need to have a very high extrusion rate to flow so far."

He said the channel is very uniform in width, averaging little more than a mile across. "It follows a sinuous, smoothly curving course that can be traced continuously on the surface just west of Atla Regio northward nearly to the large basin called Atalanta Planitia."

A few segments of the channel were mapped in 1984 by the Soviet Venera 15 and 16 orbiters which carried radar capable of resolving features down to 0.6 to 1.2 miles. With the higher resolution of Magellan, about 400 feet, the channel can be traced unbroken along its course, Saunders said.

"The challenge of understanding the origin of this channel will lead to better understanding of planetary geological processes and many related fields such as material properties and fluid mechanics," Saunders said.

In the first 243-day mapping cycle which ended May 15, the spacecraft mapped 84 percent of the planet. In its second cycle, it has mapped for the second time a 600-mile wide strip and that section of Venus is being examined to see if any changes occurred from one cycle to the other. Preliminary analysis of that data has so far revealed no changes occurring between mapping cycles.

Mission control, cafeteria hours slated for STS-48

The Mission Control Center viewing room will be open to badged JSC and contractor employees and their families during specified times of STS-48.

Based on a Thursday launch, the viewing room will be open from noon-3 p.m. and 5-7 p.m. Friday, 2-5 p.m. Saturday and Sunday, 1-4 and 5-7 p.m. Monday.

Children under the age of 5 are not permitted, and no flash photography will be allowed at any time. Viewing hours may be canceled or changed without notice; consult the JSC Employee Information Service at x36765 for the latest schedule.

The JSC cafeterias also will have special mission hours beginning the day after launch. Bldg. 3 will be open from 7 a.m.-4:30 p.m. weekdays and 11 a.m.-4:30 p.m. weekends. Bldg. 11 will be open from 6:30 a.m.-2 p.m. weekdays and 7-10 a.m. weekends.

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Associate Editors Pam Alloway
Kari Fluegel

Child Care Center has openings for several 3-year-olds

The JSC Child Care Center has several openings in the 3-year-old class, and the waiting list for that age has been exhausted.

The class consists of a maximum of 15 children, supervised by two full-time degreed teachers.

Parents may leave their children from 7 a.m.-5:30 p.m. Cost is \$77 per week.

Interested parents should contact Georgia Strain at x34734 for information on how to place a child at the center.